

**United States Department of Agriculture
Natural Resources Conservation Service**

Ecological Site Description

Site Type: Rangeland

Site Name: Shallow Sandy

Site ID: R060AY044SD

Major Land Resource Area: 60A – Pierre Shale Plains

Physiographic Features

This site occurs on gently sloping to very steep uplands.

Landform: hill, ridge, escarpment

Aspect: N/A



| | <u>Minimum</u> | <u>Maximum</u> |
|------------------------------------|----------------|----------------|
| Elevation (feet): | 2500 | 4300 |
| Slope (percent): | 3 | 45 |
| Water Table Depth (inches): | None | None |
| Flooding: | | |
| Frequency: | None | None |
| Duration: | None | None |
| Ponding: | | |
| Depth (inches): | None | None |
| Frequency: | None | None |
| Duration: | None | None |
| Runoff Class: | Medium | Very high |

Climatic Features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland steppes to the east. Annual precipitation ranges from 13 to 18 inches per year, with most occurring during the growing season. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 46° F. January is the coldest month with average temperatures ranging from about 19° F (Moorcroft CAA, WY) to about 22° F (Belle Fourche, SD). July is the warmest month with temperatures averaging from about 70° F (Moorcroft CAA, WY) to about 72° F (Belle Fourche, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 51° F. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

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Growth of cool season plants begins in early to mid March, slowing or ceasing in late June. Warm season plants begin growth about mid May and can continue to early or mid September. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

| | <u>Minimum</u> | <u>Maximum</u> |
|--|----------------|----------------|
| Frost-free period (days): | 122 | 129 |
| Freeze-free period (days): | 145 | 152 |
| Mean Annual Precipitation (inches): | 13 | 18 |

Average Monthly Precipitation (inches) and Temperature (°F):

| | Precip. Min. | Precip. Max | Temp. Min. | Temp. Max. |
|-----------|--------------|-------------|------------|------------|
| January | 0.32 | 0.43 | 7.1 | 34.1 |
| February | 0.44 | 0.57 | 12.6 | 40.1 |
| March | 0.65 | 0.94 | 19.7 | 46.5 |
| April | 1.43 | 1.72 | 29.4 | 60.2 |
| May | 2.45 | 3.19 | 39.7 | 70.6 |
| June | 2.34 | 3.38 | 48.5 | 80.1 |
| July | 1.60 | 2.78 | 54.8 | 88.0 |
| August | 1.24 | 1.76 | 53.1 | 87.7 |
| September | 1.01 | 1.50 | 42.3 | 77.0 |
| October | 0.90 | 1.11 | 31.4 | 64.9 |
| November | 0.40 | 0.61 | 19.8 | 47.5 |
| December | 0.40 | 0.48 | 10.2 | 38.0 |

| Climate Stations | | Period | |
|------------------|------------------|--------|------|
| Station ID | Location or Name | From | To |
| SD0236 | Ardmore 2 N | 1948 | 1999 |
| SD0559 | Belle Fourche | 1948 | 1999 |
| SD1124 | Buffalo Gap | 1951 | 1999 |
| WY6395 | Moorcroft CAA | 1948 | 1998 |
| WY9207 | Upton 13 SW | 1949 | 1998 |

For other climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

Influencing Water Features

No significant water features influence this site.

Representative Soil Features

The soils of this site are shallow (less than 20" to bedrock) well-drained soils formed in eolian deposits or alluvium over residuum or residuum. These soils have moderately rapid to very rapid permeability and may occur on all slopes. The bedrock may be of any kind except igneous or volcanic and is virtually impenetrable to plant roots. The surface soil will be one or more of the following textures: fine sandy loam, sandy loam, loamy fine sand, loamy sand, or sand.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Parent Material Kind: residuum, alluvium, eolian deposits
Parent Material Origin: sandstone, unspecified
Surface Texture: loamy fine sand, fine sandy loam, sandy loam, loamy sand, sand
Surface Texture Modifier: none
Subsurface Texture Group: sandy
Surface Fragments $\leq 3''$ (% Cover): 0
Surface Fragments $> 3''$ (%Cover): 0
Subsurface Fragments $\leq 3''$ (% Volume): 0-10
Subsurface Fragments $> 3''$ (% Volume): 0

| | <u>Minimum</u> | <u>Maximum</u> |
|---|------------------|----------------|
| Drainage Class: | well | excessive |
| Permeability Class: | moderately rapid | very rapid |
| Depth (inches): | 10 | 20 |
| Electrical Conductivity (mmhos/cm)*: | 0 | 2 |
| Sodium Absorption Ratio*: | 0 | 0 |
| Soil Reaction (1:1 Water)*: | 6.6 | 7.8 |
| Soil Reaction (0.1M CaCl₂)*: | NA | NA |
| Available Water Capacity (inches)*: | 1 | 2 |
| Calcium Carbonate Equivalent (percent)*: | 0 | 5 |

* - These attributes represent from 0-40 inches or to the first restrictive layer.

Plant Communities

Ecological Dynamics of the Site:

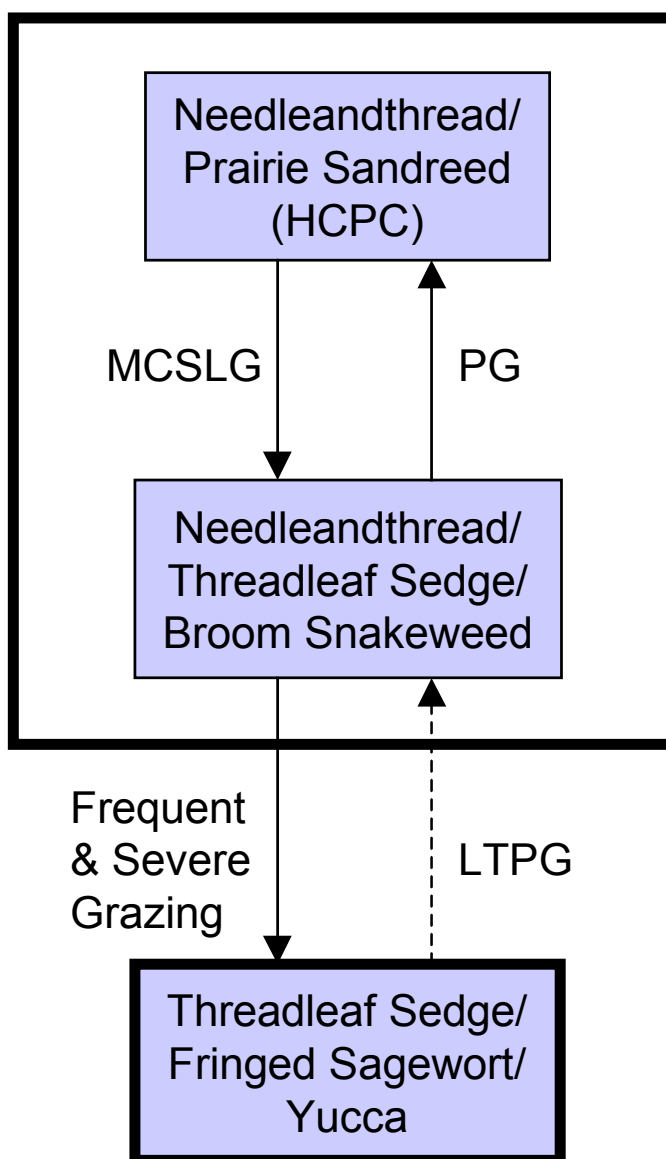
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

As this site deteriorates, species such as threadleaf sedge and fringed sagewort will increase. Mid grasses such as prairie sandreed and little bluestem will decrease in frequency and production.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



Frequent and Severe Grazing - Frequent and severe utilization of the cool-season mid-grasses during the growing season;
HCPC - Historical Climax Plant Community; **LTPG** - Long-term prescribed grazing; **MCSLG** - Moderate, continuous season-long grazing.

Plant Community Composition and Group Annual Production

| | | | Needleandthread/ Prairie Sandreed (HCPC) | | |
|------------------------------|-------------------------------------|--------|---|-----------|---------|
| COMMON/GROUP NAME | SCIENTIFIC NAME | SYMBOL | Group | lbs./acre | % Comp |
| GRASSES & GRASS-LIKES | | | | 845 - 975 | 65 - 75 |
| RHIZOMATOUS WHEATGRASSES | | | 1 | 65 - 130 | 5 - 10 |
| western wheatgrass | Pascopyrum smithii | PASM | 1 | 65 - 130 | 5 - 10 |
| thickspike wheatgrass | Elymus lanceolatus ssp. lanceolatus | ELLAL | 1 | 65 - 130 | 5 - 10 |
| | | | | | |
| bluebunch wheatgrass | Pseudoroegneria spicata | PSSP6 | 2 | 65 - 130 | 5 - 10 |
| little bluestem | Schizachyrium scoparium | SCSC | 3 | 65 - 195 | 5 - 15 |
| needleandthread | Hesperostipa comata ssp. comata | HECOC8 | 4 | 195 - 325 | 15 - 25 |
| prairie sandreed | Calamovilfa longifolia | CALO | 5 | 130 - 260 | 10 - 20 |
| sideoats grama | Bouteloua curtipendula | BOCU | 6 | 65 - 130 | 5 - 10 |
| NATIVE GRASSES & GRASS-LIKES | | | 7 | 65 - 195 | 5 - 15 |
| blue grama | Bouteloua gracilis | BOGR2 | 7 | 0 - 65 | 0 - 5 |
| Indian ricegrass | Achnatherum hymenoides | ACHY | 7 | 0 - 65 | 0 - 5 |
| prairie junegrass | Koeleria macrantha | KOMA | 7 | 0 - 65 | 0 - 5 |
| Sandberg bluegrass | Poa secunda | POSE | 7 | 0 - 65 | 0 - 5 |
| sand bluestem | Andropogon hallii | ANHA | 7 | 0 - 65 | 0 - 5 |
| sand dropseed | Sporobolus cryptandrus | SPCR | 7 | 0 - 65 | 0 - 5 |
| plains muhly | Muhlenbergia cuspidata | MUCU3 | 7 | 0 - 65 | 0 - 5 |
| threadleaf sedge | Carex filifolia | CAFI | 7 | 0 - 65 | 0 - 5 |
| other perennial grasses | | 2GP | 7 | 0 - 65 | 0 - 5 |
| | | | | | |
| FORBS | | | 9 | 65 - 195 | 5 - 15 |
| American vetch | Vicia americana | VIAM | 9 | 0 - 65 | 0 - 5 |
| aster | Aster spp. | ASTER | 9 | 0 - 65 | 0 - 5 |
| biscuitroot | Lomatium spp. | LOMAT | 9 | 0 - 65 | 0 - 5 |
| bluebells | Mertensia spp. | MERTE | 9 | 0 - 65 | 0 - 5 |
| Indian breadroot | Pedimelum esculentum | PEES | 9 | 0 - 65 | 0 - 5 |
| milkvetch | Astragalus spp. | ASTRA | 9 | 0 - 65 | 0 - 5 |
| prairie coneflower | Ratibida columnifera | RACO3 | 9 | 0 - 65 | 0 - 5 |
| purple prairie clover | Dalea purpurea | DAPU5 | 9 | 0 - 65 | 0 - 5 |
| rose pussytoes | Antennaria rosea | ANRO2 | 9 | 0 - 65 | 0 - 5 |
| scarlet gaura | Gaura coccinea | GACO5 | 9 | 0 - 65 | 0 - 5 |
| stemless hymenoxys | Tetraneuris acaulis | TEAC | 9 | 0 - 65 | 0 - 5 |
| sulphur-flower buckwheat | Eriogonum umbellatum | ERUM | 9 | 0 - 65 | 0 - 5 |
| tapertip hawksbeard | Crepis acuminata | CRAC2 | 9 | 0 - 65 | 0 - 5 |
| western yarrow | Achillea millefolium | ACMI2 | 9 | 0 - 65 | 0 - 5 |
| white prairie clover | Dalea candida | DACA7 | 9 | 0 - 65 | 0 - 5 |
| wild onion | Allium spp. | ALLIU | 9 | 0 - 65 | 0 - 5 |
| other perennial forbs | | 2FP | 9 | 0 - 65 | 0 - 5 |
| | | | | | |
| SHRUBS | | | | 130 - 260 | 10 - 20 |
| fourwing saltbush | Atriplex canescens | ATCA2 | 10 | 65 - 130 | 5 - 10 |
| OTHER SHRUBS | | | 11 | 65 - 195 | 5 - 15 |
| big sagebrush | Artemisia tridentata | ARTR2 | 11 | 0 - 65 | 0 - 5 |
| Douglas rabbitbrush | Chrysothamnus viscidiflorus | CHVI8 | 11 | 0 - 65 | 0 - 5 |
| skunkbush sumac | Rhus trilobata | RHTR | 11 | 0 - 65 | 0 - 5 |
| small soapweed | Yucca glauca | YUGL | 11 | 0 - 65 | 0 - 5 |
| winterfat | Krascheninnikovia lanata | KRLA2 | 11 | 0 - 65 | 0 - 5 |
| | | | | | |
| Annual Production lbs./acre | | | LOW | RV | HIGH |
| GRASSES & GRASS-LIKES | | | 815 - | 975 | -1125 |
| FORBS | | | 60 - | 130 | -200 |
| SHRUBS | | | 125 - | 195 | -275 |
| TOTAL | | | 1000 - | 1300 | -1600 |

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community Composition and Group Annual Production

| | | Needleandthread/ Prairie Sandreed (HCPC) | | | Needleandthread/Threadleaf Sedge/Broom Snakeweed | | | Threadleaf Sedge/Fringed Sagewort/Yucca | | |
|------------------------------|--------|---|-----------|---------|---|-----------|---------|--|-----------|---------|
| COMMON/GROUP NAME | SYMBOL | Grp | lbs./acre | % Comp | Grp | lbs./acre | % Comp | Grp | lbs./acre | % Comp |
| GRASSES & GRASS-LIKES | | | 845 - 975 | 65 - 75 | | 510 - 680 | 60 - 80 | | 275 - 413 | 50 - 75 |
| RHIZOMATOUS WHEATGRASSES | | 1 | 65 - 130 | 5 - 10 | 1 | 43 - 85 | 5 - 10 | 1 | 0 - 28 | 0 - 5 |
| western wheatgrass | PASM | 1 | 65 - 130 | 5 - 10 | 1 | 43 - 85 | 5 - 10 | 1 | 0 - 28 | 0 - 5 |
| thickspike wheatgrass | ELLAL | 1 | 65 - 130 | 5 - 10 | 1 | 43 - 85 | 5 - 10 | 1 | 0 - 28 | 0 - 5 |
| | | | | | | | | | | |
| bluebunch wheatgrass | PSSP6 | 2 | 65 - 130 | 5 - 10 | 2 | 0 - 43 | 0 - 5 | 2 | | |
| little bluestem | SCSC | 3 | 65 - 195 | 5 - 15 | 3 | 0 - 43 | 0 - 5 | 3 | 0 - 28 | 0 - 5 |
| needleandthread | HECOC8 | 4 | 195 - 325 | 15 - 25 | 4 | 170 - 255 | 20 - 30 | 4 | 28 - 83 | 5 - 15 |
| prairie sandreed | CALO | 5 | 130 - 260 | 10 - 20 | 5 | 0 - 85 | 0 - 10 | 5 | 0 - 28 | 0 - 5 |
| sideoats grama | BOCU | 6 | 65 - 130 | 5 - 10 | 6 | 0 - 43 | 0 - 5 | 6 | 0 - 28 | 0 - 5 |
| NATIVE GRASSES & GRASS-LIKES | | 7 | 65 - 195 | 5 - 15 | 7 | 43 - 255 | 5 - 30 | 7 | 83 - 248 | 15 - 45 |
| blue grama | BOGR2 | 7 | 0 - 65 | 0 - 5 | 7 | 43 - 128 | 5 - 15 | 7 | 11 - 55 | 2 - 10 |
| Indian ricegrass | ACHY | 7 | 0 - 65 | 0 - 5 | 7 | 0 - 17 | 0 - 2 | | | |
| prairie junegrass | KOMA | 7 | 0 - 65 | 0 - 5 | 7 | 0 - 43 | 0 - 5 | 7 | 0 - 28 | 0 - 5 |
| Sandberg bluegrass | POSE | 7 | 0 - 65 | 0 - 5 | 7 | 0 - 43 | 0 - 5 | 7 | 0 - 28 | 0 - 5 |
| sand bluestem | ANHA | 7 | 0 - 65 | 0 - 5 | | | | | | |
| sand dropseed | SPCR | 7 | 0 - 65 | 0 - 5 | 7 | 17 - 85 | 2 - 10 | 7 | 11 - 55 | 2 - 10 |
| plains muhly | MUCU3 | 7 | 0 - 65 | 0 - 5 | 7 | 0 - 26 | 0 - 3 | | | |
| threadleaf sedge | CAFI | 7 | 0 - 65 | 0 - 5 | 7 | 43 - 128 | 5 - 15 | 7 | 55 - 138 | 10 - 25 |
| threawn | ARIST | | | | 7 | 0 - 43 | 0 - 5 | 7 | 0 - 55 | 0 - 10 |
| sixweeks fescue | VUOC | | | | 7 | 0 - 43 | 0 - 5 | 7 | 0 - 28 | 0 - 5 |
| other perennial grasses | 2GP | 7 | 0 - 65 | 0 - 5 | 7 | 0 - 43 | 0 - 5 | 7 | 0 - 28 | 0 - 5 |
| NON-NATIVE GRASSES | | 8 | | | 8 | 0 - 85 | 0 - 10 | 8 | 11 - 83 | 2 - 15 |
| cheatgrass | BRTE | | | | 8 | 0 - 85 | 0 - 10 | 8 | 11 - 83 | 2 - 15 |
| FORBS | | 9 | 65 - 195 | 5 - 15 | 9 | 43 - 128 | 5 - 15 | 9 | 28 - 110 | 5 - 20 |
| American vetch | VIAM | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 17 | 0 - 2 | | | |
| aster | ASTER | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| biscuitroot | LOMAT | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 26 | 0 - 3 | 9 | 0 - 11 | 0 - 2 |
| bluebells | MERTE | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 17 | 0 - 2 | | | |
| green sagewort | ARDR4 | | | | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 55 | 0 - 10 |
| Indian breadroot | PEES | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 17 | 0 - 2 | | | |
| milkvetch | ASTRA | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| prairie coneflower | RACO3 | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| purple prairie clover | DAPU5 | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| rose pussytoes | ANRO2 | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 26 | 0 - 3 | 9 | 0 - 17 | 0 - 3 |
| scarlet gaura | GACO5 | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 17 | 0 - 2 | | | |
| stemless hymenoxys | TEAC | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| sulphur-flower buckwheat | ERUM | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| sweetclover | MELIL | | | | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 55 | 0 - 10 |
| tapertip hawksbeard | CRAC2 | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 17 | 0 - 2 | | | |
| thistle | CIRSI | | | | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 55 | 0 - 10 |
| western yarrow | ACMI2 | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| white prairie clover | DACA7 | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 26 | 0 - 3 | | | |
| wild onion | ALLIU | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 26 | 0 - 3 | 9 | 0 - 17 | 0 - 3 |
| other perennial forbs | 2FP | 9 | 0 - 65 | 0 - 5 | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| other annual forbs | 2FA | | | | 9 | 0 - 43 | 0 - 5 | 9 | 0 - 28 | 0 - 5 |
| SHRUBS | | | 130 - 260 | 10 - 20 | | 85 - 213 | 10 - 25 | | 55 - 165 | 10 - 30 |
| fourwing saltbush | ATCA2 | 10 | 65 - 130 | 5 - 10 | 10 | 0 - 43 | 0 - 5 | 10 | | |
| OTHER SHRUBS | | 11 | 65 - 195 | 5 - 15 | 11 | 85 - 170 | 10 - 20 | 11 | 55 - 165 | 10 - 30 |
| big sagebrush | ARTR2 | 11 | 0 - 65 | 0 - 5 | 11 | 0 - 43 | 0 - 5 | 11 | 0 - 28 | 0 - 5 |
| broom snakeweed | GUSA2 | | | | 11 | 0 - 43 | 0 - 5 | 11 | 28 - 55 | 5 - 10 |
| Douglas rabbitbrush | CHVI8 | 11 | 0 - 65 | 0 - 5 | 11 | 0 - 43 | 0 - 5 | 11 | 0 - 28 | 0 - 5 |
| fringed sagewort | ARFR4 | | | | 11 | 0 - 43 | 0 - 5 | 11 | 28 - 55 | 5 - 10 |
| skunkbush sumac | RHTR | 11 | 0 - 65 | 0 - 5 | 11 | 0 - 43 | 0 - 5 | 11 | 0 - 28 | 0 - 5 |
| small soapweed | YUGL | 11 | 0 - 65 | 0 - 5 | 11 | 17 - 68 | 2 - 8 | 11 | 28 - 55 | 5 - 10 |
| winterfat | KRLA2 | 11 | 0 - 65 | 0 - 5 | | | | | | |
| other shrubs | 2SHRUB | | | | 11 | 0 - 43 | 0 - 5 | 11 | 0 - 28 | 0 - 5 |
| Annual Production lbs./acre | | LOW RV HIGH | | | LOW RV HIGH | | | LOW RV HIGH | | |
| GRASSES & GRASS-LIKES | | 815 - 975 - 1125 | | | 580 - 616 - 655 | | | 325 - 371 - 415 | | |
| FORBS | | 60 - 130 - 200 | | | 40 - 85 - 130 | | | 25 - 69 - 115 | | |
| SHRUBS | | 125 - 195 - 275 | | | 80 - 149 - 215 | | | 50 - 110 - 170 | | |
| TOTAL | | 1000 - 1300 - 1600 | | | 700 - 850 - 1000 | | | 400 - 550 - 700 | | |

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more information is collected, some of these plant community descriptions may be revised or removed, and new ones added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Needleandthread/Prairie Sandreed Plant Community

The plant community upon which interpretations are primarily based is the Needleandthread/Prairie Sandreed Plant Community. This is also considered the Historic Climax Plant Community (HCPC). Potential vegetation is about 65-75% grasses or grass-like plants, 5-15% forbs, and 10-20% woody plants. The plant community is a mix of warm and cool season midgrasses. Major grasses include needleandthread, prairie sandreed, little bluestem, and sideoats grama. Other grasses occurring include bluebunch wheatgrass, Sandberg bluegrass, blue grama, and threadleaf sedge. The plant community is stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought resistance. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity).

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD6003

Growth curve name: Pierre Shale Plains, cool-season/warm-season co-dominant.

Growth curve description: Cool-season, warm-season co-dominant.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 3 | 10 | 20 | 28 | 21 | 10 | 5 | 3 | 0 | 0 |

Transitions or pathways leading to other plant communities are as follows:

- Moderate, continuous season-long grazing will convert the plant community to the *Needleandthread/Threadleaf Sedge/Broom Snakeweed Plant Community*.

Needleandthread/Threadleaf Sedge/Broom Snakeweed Plant Community

This plant community is the result of moderate continuous season-long grazing. The understory of grass includes needleandthread, threadleaf sedge, and prairie junegrass. When compared to the Historic Climax Plant Community, prairie sandreed and little bluestem have decreased. Threadleaf sedge and needleandthread have increased. Broom snakeweed has invaded. This community is well suited to grazing by both domestic livestock and wildlife, during the spring summer and fall. The communities' soil, biotic integrity and watershed is intact, although more than normal runoff may occur due to the sod forming vegetation.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD6002

Growth curve name: Pierre Shale Plains, cool-season dominant, warm-season sub-dominant.

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Growth curve description: Cool-season dominant, warm-season sub-dominant.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 3 | 10 | 23 | 34 | 15 | 6 | 5 | 4 | 0 | 0 |

Transitional pathways leading to other plant communities are as follows:

- Prescribed grazing will return this plant community to the *Needleandthread/Prairie Sandreed Plant Community (HCPC)*.
- Frequent and severe grazing will convert this plant community to the *Threadleaf Sedge/Fringed Sagewort/Yucca Plant Community*.

Threadleaf Sedge/Fringed Sagewort/Yucca Plant Community

This plant community is the result of frequent and severe grazing. A sod of threadleaf sedge dominates it. Broom snakeweed and yucca have increased. When the historic climax plant community is replaced by sod forming communities and woody shrubs, grass production is reduced.

The soil is generally well protected on this plant community. The biotic integrity may be reduced due to low vegetative production. The sod formed by these grasses is resistant to water infiltration. While this sod protects the site, off-site areas are affected by excessive runoff that may cause gully erosion. This sod is resistant to change and may require practices such as long-term prescribed grazing to return to a mid grass community.

The following growth curve shows the estimated monthly percentages of total annual growth of the dominant species expected during an average year:

Growth curve number: SD6002

Growth curve name: Pierre Shale Plains, cool-season dominant, warm-season sub-dominant.

Growth curve description: Cool-season dominant, warm-season sub-dominant.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 3 | 10 | 23 | 34 | 15 | 6 | 5 | 4 | 0 | 0 |

Transitional pathways leading to other plant communities are as follows:

- Long-term prescribed grazing will eventually return this plant community to the *Needleandthread/Threadleaf Sedge/Broom Snakeweed Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Needleandthread/Prairie Sandreed Plant Community (HCPC): The predominance of grasses in this plant community favors grazers and mixed-feeders, such as bison, elk, and antelope. Suitable thermal and escape cover for deer may be limited due to the low quantities of woody plants. However, topographical variations could provide some escape cover. When found adjacent to sagebrush dominated states, this plant community may provide brood rearing/foraging areas for sage grouse, as well as lek sites. Other birds that would frequent this plant community include western meadowlarks, horned larks, and golden eagles. Many grassland obligate small mammals would occur here.

Needleandthread/Threadleaf Sedge/Broom snakeweed: These communities provide foraging for antelope and other grazers. They may be used as a foraging site by sage grouse if proximal to woody cover. States with less than 5" stubble height and greater than 30% bare ground are favorable for mountain plovers. Generally, these are not target plant communities for wildlife habitat management.

Threadleaf Sedge/Fringed Sagewort/Yucca: These communities provide limited foraging for antelope and other grazers due to low production. They may be used as a foraging site by sage grouse if proximal to woody cover. States with less than 5" stubble height and greater than 30% bare ground are favorable for mountain plovers. Generally, these are not target plant communities for wildlife habitat management.

Animal Preferences (Quarterly – 1,2,3,4[†])

| Common Name | Cattle | Sheep | Horses | Deer | Antelope | Bison | Elk |
|---------------------------------|---------|---------|---------|---------|----------|---------|---------|
| Grasses & Grass-like | | | | | | | |
| blue grama | U D P D | D P P D | U D P U | D P P D | D P P D | U D P U | U D P U |
| bluebunch wheatgrass | U P D D | P P P P | U P D D | D D D D | D D D D | U P D D | U P D D |
| Indian ricegrass | D P U D | N P N D | D P U D | N P N D | N P N D | D P U D | D P U D |
| little bluestem | U D D U | U U D U | U D D U | N D N N | N D N N | U D D U | U D D U |
| needleandthread | U D U D | N D N U | U D U D | N D N U | N D N U | U D U D | U D U D |
| plains muhly | U U D U | U U D U | U U D U | N N N N | N N N N | U U D U | U U D U |
| prairie junegrass | U D U D | N D N U | U D U D | N D N U | N D N U | U D U D | U D U D |
| prairie sandreed | U D D U | U D U U | U D D U | U U D U | U U D U | U D D U | U D D U |
| sand bluestem | U D P D | U U D U | U D P D | U D U U | U D U U | U D P D | U D P D |
| sand dropseed | N U N N | N U N N | N U N N | N U N N | N U N N | N U N N | N U N N |
| Sandberg bluegrass | U U U U | U D U U | N U N N | N D N N | N D N N | N U N N | N U N N |
| sideoats grama | U D P D | U P D D | U D P U | U P D U | U P D U | U D P U | U D P U |
| thickspike wheatgrass | U D D U | U D U U | U D D U | N D N N | N D N N | U D D U | U D D U |
| threadleaf sedge | U P U D | U P U D | U D U D | U D U D | U D U D | U D U D | U D U D |
| western wheatgrass | U P D D | U D U U | U P D U | N D N N | N D N N | U P D U | U P D U |
| Forbs | | | | | | | |
| American vetch | U D P U | U P P U | U D P U | U P P U | U P P U | U D P U | U P P U |
| aster | U U D U | U U D U | U U D U | U U D U | U U D U | U U D U | U U D U |
| biscuitroot | U D U U | U D D U | U D U U | U D D U | U D D U | U D U U | U D D U |
| bluebells | U D U U | U P P U | U D U U | U P P U | U P P U | U D U U | U P P U |
| Indian breadroot | U U U U | U D U U | U U U U | U D U U | U D U U | U U U U | U D U U |
| milkvetch | U U U U | U D U U | U U U U | U D U U | U D U U | U U U U | U D U U |
| prairie coneflower | U U D U | U P P U | U U D U | U P P U | U P P U | U U D U | U P P U |
| purple prairie clover | U D P U | U P P U | U D P U | U P P U | U P P U | U D P U | U P P U |
| rose pussytoes | U U U U | U U U U | U U U U | U U U U | U U U U | U U U U | U U U U |
| scarlet gaura | U U U U | N U U N | U U U U | N U U N | N U U N | U U U U | N U U N |
| stemless hymenoxys | U U U U | N U U N | U U U U | N U U N | N U U N | U U U U | N U U N |
| sulphur-flower buckwheat | U U D U | U U U U | U U D U | U U U U | U U U U | U U D U | U U U U |
| tapertip hawksbeard | U U D U | N D U N | U U D U | N D U N | N D U N | U U D U | N D U N |
| western yarrow | U U U U | N U U N | U U U U | N U U N | N U U N | U U U U | N U U N |
| white prairie clover | U D P U | U P P U | U D P U | U P P U | U P P U | U D P U | U P P U |
| wild onion | U D U U | U D D U | U D U U | U D D U | U D D U | U D U U | U D D U |
| Shrubs | | | | | | | |
| big sagebrush | U U U U | D U U D | U N U U | P U D P | P P P P | U N U U | D U U U |
| Douglas rabbitbrush | D U U D | D U U D | D U U D | P U D D | P U D D | D U U D | D U U D |
| fourwing saltbush | P D D P | P D D P | P D D P | P D D P | P D D P | P D D P | P D D P |
| skunkbush sumac | D U U D | D D D D | D U U D | D U U D | D U U D | D U U D | D U U D |
| small soapweed | D N N D | D U U D | D N N D | D U U D | D U U D | D N N D | D U U D |
| winterfat | P P P P | P P P P | P P P P | P P P P | P P P P | P P P P | P P P P |

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

[†] Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

| Plant Community | Average Annual Production (lbs./acre, air-dry) | Stocking Rate* (AUM/acre) |
|--|---|------------------------------|
| Needleandthread/Prairie Sandreed | 1300 | 0.35 |
| Needleandthread/Threadleaf Sedge/Broom Snakeweed | 850 | 0.20 |
| Threadleaf Sedge/Fringed Sagewort/Yucca | 550 | 0.10 |

* Based on 790 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B and C. Infiltration ranges from moderately rapid to rapid. Runoff potential for this site varies from medium to very high depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short grasses form a strong sod and dominate the site. Normally areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

Other Products

Seed harvest of native plant species can provide additional income on this site.

Supporting Information

Associated Sites

(060AY010SD) – Loamy 13-16" P.Z.
(060AY041SD) – Loamy 16-18" P.Z.

(060AY009SD) – Sandy
(060AY024SD) – Shallow Loamy

Similar Sites

(060AY024SD) – Shallow Loamy [less needleandthread & prairie sandreed; slightly higher production]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Those involved in developing this site description include: Everet Bainter, Range Management Specialist, NRCS; Stan Boltz, Range Management Specialist, NRCS; Glen Mitchell, Range Management Specialist, NRCS; Cheryl Nielsen, Range Management Specialist, NRCS.

| <u>Data Source</u> | <u>Number of Records</u> | <u>Sample Period</u> | <u>State</u> | <u>County</u> |
|--------------------|--------------------------|----------------------|--------------|---------------|
| SCS-RANGE-417 | | | | |

State Correlation

This site has been correlated between Montana, Nebraska, South Dakota & Wyoming in MLRA 60A.

Field Offices

| | | | | |
|-------------------|--------------|-----------------|----------------|--------------|
| Belle Fourche, SD | Custer, SD | Hot Springs, SD | Pine Ridge, SD | Sundance, WY |
| Broadus, MT | Ekalaka, MT | Lusk, WY | Rapid City, SD | Wall, SD |
| Buffalo, SD | Faith, SD | Martin, SD | Rushville, NE | |
| Chadron, NE | Gillette, WY | Newcastle, WY | Sturgis, SD | |

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43e – Sagebrush Steppe, 43g – Semiarid Pierre Shale Plains, and 43k – Dense Clay Prairie.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.unl.edu>)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)

USDA, NRCS, 2002. National Soil Survey Handbook, title 430-VI. (<http://soils.usda.gov/procedures/handbook/main.htm>)

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

| | | | |
|--|---------------|--|---------------|
| _____ MT, State Range Management Specialist | _____ Date | _____ NE, State Range Management Specialist | _____ Date |
|--|---------------|--|---------------|

| | | | |
|--|---------------|--|---------------|
| _____ SD, State Range Management Specialist | _____ Date | _____ WY, State Range Management Specialist | _____ Date |
|--|---------------|--|---------------|

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